

**Meeting:** 1003, Atlanta, Georgia, SS 16A, AMS Special Session on Inverse Spectral Geometry, I

1003-35-1110      **Steve Zelditch\*** (zelditch@math.jhu.edu), Department of Mathematics, Johns Hopkins University, Baltimore, MD 21218. *Feynman diagrams and inverse spectral theory.*

My talk is about spectral invariants of the Laplacian with Dirichlet or Neumann boundary conditions known as the wave invariants of smooth bounded domains in Euclidean space. To each periodic billiard trajectory is associated a sequence of wave invariants. Each wave invariant is a complicated expression in the boundary curvature function at its bounce points. I will focus on wave invariants associated to 2-link orbits on a domain with one symmetry. To each term in each wave invariant I will associate a Feynman diagram. The most important wave invariants are those with maximal numbers of derivatives of the curvature. It turns out there are just three diagrams corresponding to such terms. I will explain how to calculate the corresponding terms and how to determine a real analytic domain with a symmetry from them. (Received October 04, 2004)